



Taxonomic revision of Mozambique dung beetle species in the genus *Diastellopalpus* van Lansberge, 1886 (Coleoptera: Scarabaeidae: Scarabaeinae)

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Abstract

Recently, there has been growing attention paid to the Mozambican dung beetle fauna, including the description of several new species. In this paper, we revise the taxonomy of species recorded from Mozambique in the genus *Diastellopalpus* van Lansberge, 1886, including the description of *Diastellopalpus scholtzi* Daniel, Strümpher, Josso & Davis, new species. We also report a new country record for *Diastellopalpus neavei* (d'Orbigny, 1914). Moreover, *Diastellopalpus orbignyi* Péringuey, 1904 is removed from subjective synonymy with *Diastellopalpus infernalis* van Lansberge, 1887 and proposed as a valid species. Currently, Mozambique encompasses five valid species of the genus *Diastellopalpus*, namely: *Diastellopalpus infernalis* van Lansberge, 1887, *D. quinquedens* Bates, 1888, *D. neavei*, *D. orbignyi* and *D. scholtzi*, new species. We redescribe the former four species and include an examination of the types of their junior synonyms. Furthermore, we diagnose, illustrate, and provide a distribution map for all five species and compare them to the morphologically most similar species in the genus. We designate lectotypes for the following species-group taxa: *Diastellopalpus nyassicus* Kolbe, 1901, *D. orbignyi*, *D. quinquedens* Bates, 1888, *Onthophagus ponderosus* Péringuey, 1896, and *O. tridepressus* d'Orbigny, 1902. Finally, we provide an updated identification key for the species of *Diastellopalpus* recorded from Mozambique.

Key words: Afrotropical Region, forest, Onthophagini, Scarabaeoidea, systematics

Introduction

The dung beetle genus *Diastellopalpus* van Lansberge, 1886 has been subjected to a taxonomic revision and phylogenetic analysis (Josso & Prévost 2000) followed by a biogeographical reappraisal (Davis & Scholtz 2010). Recently, two additional species were added to the genus (Walter 2013; Josso & Prévost 2014). The genus *Diastellopalpus* comprises 34 valid, large-bodied species with an intertropical distribution endemic to Africa (Josso & Prévost 2000, 2014; Davis & Scholtz 2010; Walter 2013). Biogeographically, the genus *Diastellopalpus* comprises two main lineages (Davis *et al.* 2008; Davis & Scholtz 2010). One primarily montane, southeastern lineage is distributed from the northeast Tanzanian coast inland along the Eastern Arc Mountains and Malawi highlands to the inselbergs and coastal sand forests of central Mozambique. By contrast, the other more speciose lineage is centred in West, Central and East Africa where it is associated with montane or lowland biotopes, primarily in wet forest, dry forest or dry forest/grassland mosaic although there are a few representatives in moist savannah woodland and a single species centred on montane grassland. Unlike the mainly forest species of this northwestern lineage, two southerly moist woodland species of the terminal clade have penetrated or speciated within southeast Africa (Davis

& Scholtz 2010), respectively, *Diastellopalpus infernalis* van Lansberge, 1887 (here split into two species, *D. infernalis* and the revalidated, southeasterly species, *D. orbigny* Péringuey, 1904) and *Diastellopalpus quinquedens* Bates, 1888.

A major revision of dung beetle species (Ferreira 1967) and a recent updated checklist (Daniel & Génier 2019) recognized only two valid species of *Diastellopalpus* from Mozambique: *D. infernalis* and *D. quinquedens*. However, a project on dung beetles from Mount Mabu in the South East Africa Montane Archipelago ecoregion in northern Mozambique Mozambique (see Daniel *et al.* 2023a, b, 2024), has recorded further *Diastellopalpus* species to which we have added specimens from Mozambique housed in museums across South Africa and overseas. Therefore, in this paper, we review the taxonomy of *Diastellopalpus infernalis* and *D. quinquedens*, including a description of *D. scholtzi* Daniel, Strümpher, Josso & Davis, new species. We also revalidate *D. orbigny*, and report a new country record for *D. neavei* (d'Orbigny, 1914). This study increases the number of currently valid *Diastellopalpus* species distributed in Mozambique to five. Lastly, we provide an identification key for all these five species.

Material and methods

We studied type material of all *Diastellopalpus* species recorded from Mozambique, either using high resolution photographs or physical examination of the specimens using an Olympus dissecting microscope. We examined a total of 856 specimens as follows: *Diastellopalpus scholtzi*, new species (18), *D. infernalis* (58), *D. neavei* (579), *D. orbigny* (114) and *D. quinquedens* (87). Measurements of the total body length (from tip of clypeus to posterior extremity of pygidium) and width (the greatest width of pronotum) were made using a digital calliper.

To provide nomenclatural stability, we designated lectotypes. The proposed designation of lectotypes is in accordance with Article 74 of the International Code of Zoological Nomenclature, henceforth the *Code* (ICZN 1999).

Data on labels of type specimens are provided verbatim between quotation marks (“”), a vertical bar [|] separates subsequent lines on a single label; subsequent labels are separated by a double vertical bar [||]. Handwritten label data are underlined. Remarks and additional comments are placed in square brackets ([]).

The examined material is deposited at the following institutions:

BMSA—National Museum, Bloemfontein, South Africa;

FMNH—Field Museum of Natural History, Chicago, USA;

JFJC—Private collection of Jean-François Josso, Muzillac, France;

MCZ—Museum of Comparative Zoology, Harvard University, Cambridge, USA;

MFNB—Museum für Naturkunde, Berlin, Germany;

MNHN—Muséum national d'Histoire naturelle de Paris, France;

RMNH—Naturalis Biodiversity Center (formerly Rijksmuseum van Natuurlijke Historie) Leiden, Netherlands;

SAMC—Iziko Museum of South African, Cape Town, South Africa;

SANC—South African National Collection of Insects, Pretoria, South Africa;

TMSA—Ditsong National Museum of Natural History (formerly Transvaal Museum of South Africa), Pretoria, South Africa.

Systematics

Tribe Onthophagini Streubel, 1846

Genus *Diastellopalpus* van Lansberge, 1886

Diastellopalpus van Lansberge, 1886: 91; van Lansberge 1887: 110; Bates 1888: 240; Kolbe 1893: 147–151; Kolbe 1901: 72; Felsche 1901: 154; Péringuey 1901: 109, 265; d'Orbigny 1902: 18, 304; d'Orbigny 1904: 328, 330; d'Orbigny 1908: 202, 206; d'Orbigny 1913: 51, 577, 720; d'Orbigny 1914: 45–460; d'Orbigny 1915: 399; Marcus 1914: 201; Marcus 1920: 177, 189, 196; Marcus 1921: 163, 177; Gillet 1927: 260–261; Ferreira 1965: 1176, 1236;

Ferreira 1967: 429, 478–479; Ferreira 1972: 545–546; Cambefort & Mauchamp 1980: 177, 180; Walter 1989: 6; Cambefort & Walter 1991: 407–408; Moretto 1999: 33; Josso & Prévost 2000: 9, 10, 17, 101, 107, 114, 116; Davis *et al.* 2008: 184–185, 188, 191, 196, 200, 203, 227; Scholtz *et al.* 2009: 235, 266, 269, 271, 274, 538; Davis & Scholtz 2010: 407–410, 416, 418, 421; Branco 2011: 13; Walter 2013: 15, 17; Josso & Prévost 2014: 19, 22; Gillet & Barr 2018: 433, 435, 437; Davis *et al.* 2020: 441.

Type species: *Scarabaeus tridens* Fabricius, 1871, by subsequent designation (Davis *et al.* 2008: 193).

Redescription

Size: 9–26 mm. **Colour:** Black, brown, or, black elytra with metallic green, blue, or copper head and pronotum. **Head.** Clypeus arcuate, ogival-shaped or somewhat truncate apically. Frons with straight or slightly arcuate carina. Vertex hornless, horned or with multidentate carina. Eyes elliptical (in dorsal view). Antenna with nine antennomeres; antennal club cupuliform. Labial palpi with three palpomeres; basal joint of palpomere 1 triangularly dilated internally. **Pronotum.** Convex, posterior margin of pronotal disc with sharp or rounded projection medially; anterior part of pronotal disc with transverse carina or strong median projection, each lateral side with one to two tubercles; anterior declivity with one or more depressions. **Elytra.** Large or short with eight striae; striae with distinct crenulate double line interrupted by fine, minute ocellate punctures; interstriae smooth, shiny or dull. Epipleuron surface smooth, wider basally, narrower apically. Metathoracic wings fully developed. **Ventrites.** Meso- and metaventrite dull or shiny metallic. Metaventrite with distinct medial-longitudinal projection, acute anteriorly. Six visible abdominal ventrites, finely setigerous laterally, glabrous medially. **Pygidium.** Convex, wider than high, and strongly marginate, marginal bead obtusely angular basally. **Legs.** Robust; apical edge of protibiae strongly oblique; pro- meso- and metatarsi with five tarsomeres and pair of tiny claws; latero-posterior margin of meso- and metafemora with distinct longitudinal hollow. Meso- and metatibiae flattened, gradually expanded almost to apex with scattered stiff setae, indentation on outer margin. Mesotibiae with two adjacent projecting spurs on inner margin. Metatibiae with only one projecting spur on inner margin. Meso- and metatrochanter projecting adjacently to meso- and metafemur, respectively. **Aedeagus:** Parameres short and robust with symmetrical or asymmetrical apical tips.

Differential diagnosis. The genus *Diastellopalpus* is similar to the genus *Proagoderus* van Lansberge, 1833 as both genera share the posterior margin of the pronotal disc with a median projection. However, the genus *Diastellopalpus* bears the first joint of the labial palpi triangularly dilated internally, which is lacking in the genus *Proagoderus*. Although the Onthophagini genera *Stiptopodius* Harold, 1871 and *Stiptotarsus* Branco, 1989 also show the first labial palpomere triangularly dilated internally, these two genera have eight antennomeres. By contrast, the genus *Diastellopalpus* has nine antennomeres.

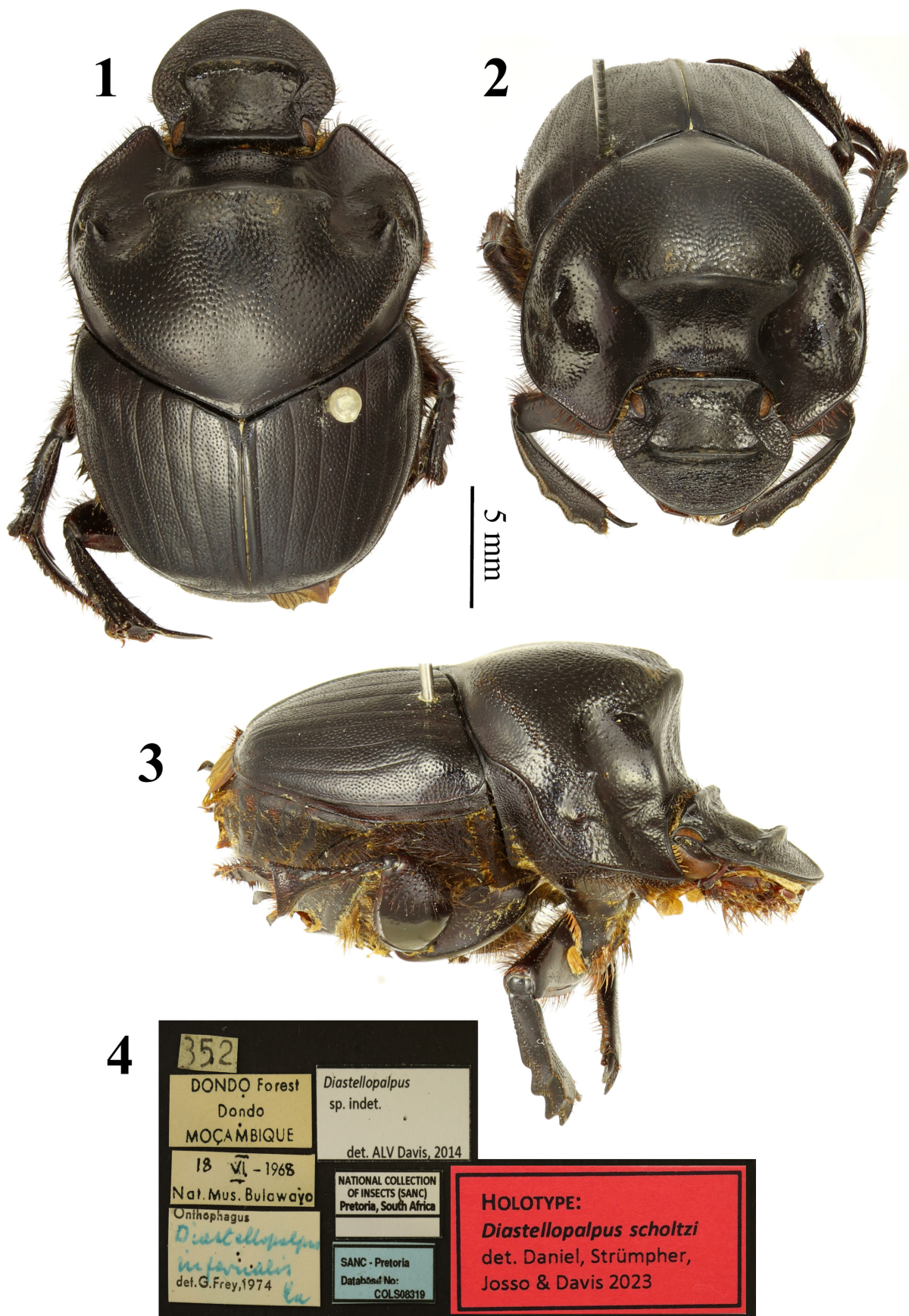
Diastellopalpus scholtzi Daniel, Strümpher, Josso & Davis, new species

LSIDurn:lsid:zoobank.org:act:EBFC9E75-06A1-4729-9C74-AF9B9949615B

(Figs. 1–4, 5, 8, 13, 32)

Type locality: “Dondo Forest, Moçambique” [Dondo Forest, Sofala Province, Mozambique] (Fig. 32).

Type material. HOLOTYPE, ♂ (SANC: SANC-TYPH-02483) (Figs. 1–5): “DONDO Forest | Dondo [Sofala Province] | Moçambique [Mozambique]” || “18 vi-1968 | Nat. [Natural] Mus. [Museum] Bulawayo [Zimbabwe]” || “352” || “*Onthophagus* | (*Diastellopalpus*) *infernalis* Lan [van Lansberge] | det. G. [George] Frey, 1974” || “NATIONAL COLLECTION | OF INSECTS (SANC) | Pretoria, South Africa || *Diastellopalpus* | sp. indet. | det. ALV. Davis, 2014” || “SANC—Pretoria | Database No: | COLS08319” || “SANC-TYPH-02483 [red cardstock]” || “**HOLOTYPE: *Diastellopalpus scholtzi*** | Daniel, Strümpher, Josso & Davis | 2023” [red cardstock]. **PARATYPE:** 1♀ (SANC): “Beira, Mozam [Beira, Sofala Province, Mozambique] | (15 mi [les] N) 19. I. 72 [1972] | Bornemissza & Kirk” || “348” [Trapped to a composite bait of buffalo and human dung] || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “*Onthophagus* | (*Diastellopalpus*) *infernalis* Lan [van Lansberge] | det.G. [George] Frey 1974” || “NATIONAL COLLECTION | OF INSECTS (SANC) | Pretoria, South Africa” || “*Diastellopalpus* | sp. indet. | det. ALV. Davis, 2014” || “SANC—Pretoria | Database No: | COLS30545” || “**PARATYPE: *Diastellopalpus***



FIGURES 1–4. *Diastellopalpus scholtzi* Daniel, Strümpher, Josso & Davis new species, holotype (SANC). 1, habitus, dorsal view; 2, head and pronotum; 3, habitus, lateral view; 4, holotype labels. Photos by W.P. Strümpher.



FIGURES 5–7. Head and pronotal disc, dorsal view. 5, *Diastellopalpus scholtzi* Daniel, Strümpher, Josso & Davis new species, holotype (Photo by W.P. Strümpher); 6, *Diastellopalpus infernalis* van Lansberge, 1887, holotype (Photo courtesy of Yvonne van Dam, copyright RMNH); 7, *Diastellopalpus orbigny* Péringuey, 1904, valid species (Photo by W.P. Strümpher).

scholtzi | Daniel, Strümpher, Josso & Davis | 2023” [yellow cardstock]”. **PARATYPES:** 8♂♂, 4♀♀ (BMSA: BMSA(C) 138113–138124): “MOZ [Mozambique]: Zambézia [Province] | Mabu Forest, Mt. Mabu | Foothills—Trans [Transect]. 12 | 16°17'04”S, 36°23'43”E | 18–20.iv.2022, 1090 m | Daniel, Nganhane & Strumpher” || “Hum. [Human] dung pitfall trap | Dense woodland & bamboo forest” || **PARATYPE:** *Diastellopalpus scholtzi* | Daniel, Strümpher, Josso & Davis | 2023” [yellow cardstock]”. **PARATYPES:** 4♀♀ same data (TMSA).

Description of the male holotype

Size: Length: 22.00 mm, width: 13.60 mm.

Colour (Figs. 1–3): Dorsal black. Ventral dark brown.

Head (Figs. 1–3, 5): Margin arcuate, surface dull, rugose with transversal wrinkles, punctures oblique anterolaterally, ocellate posteriorly, each puncture bearing minute seta. Clypeus arcuate and distinctly marginate with unpunctate strip. Clypeo-genal suture visible, genae slightly protruding externally. Straight and continuous transverse carina on both frons and vertex, both carinae similarly high. Lateral tips of vertex carina separated from eyes. Eyes brown with random black spots.

Pronotum (Fig. 1–3, 5): Wider than long, surface matte, smooth, uniformly punctate, except on medial line of posterior quarter, glabrous, almost unpunctate; punctures bearing fine, short, black setae. Anterior part of pronotum with three depressions separated by two longitudinal carinae; two lateral depressions deeply concave, median depression widely, shallowly concave. Distinct tooth-like tubercle slightly projected adjacent to lateral depressions. Dorsum of median depression bearing distinct transverse, non-interrupted, unpunctate carina; surface of median depression with faint longitudinal medial line.

Elytra (Figs. 1, 3): Shorter in length than combined width, with eight deeply marked striae. Interstriae dull, smooth, irregularly punctate, punctures with fine, short, black setae; interstria 1 narrower than others, interstria 2 wider than others. Humeral callus and apical callosity present.

Prosternum and propleuron: Surface dull, with a few setae set irregularly.

Ventrites: Mesoventrite surface dull, glabrous, faintly punctate. Mesometaventral suture convex, feebly visible. Metaventrite surface shiny, irregularly punctate, except unpunctate on medial longitudinal line; antero-lateral edge with long setae, remaining parts glabrous.

Pygidium: Surface dull, faintly punctate, punctures bearing short, black setae.

Legs (Figs. 1–3): Between dorsal and ventral surface, profemoral margins with row of strong setae; dorsal surface shiny and glabrous, laterally punctate; ventral surface shagreened, shiny and punctate, with some punctures bearing fine setae; upper anterior and posterior edges strongly marginate. Protibiae slender basally and stouter apically, four triangular teeth present on outer margin; edge between teeth weakly sinuate. Lateral row of stiff setae present on inner margin, two parallel rows of fine setae present on outer margin. Protibial spur inwardly curved. Protarsomere 5 longer than protarsomeres 1–4, remainder equal in size. Meso- and metafemora complanate, surface shiny, glabrous and faintly punctate; posterior margin with distinct apical-basal longitudinal hollow. Mesofemora shorter than metafemora. Meso- and metatibiae flattened, gradually expanded almost to apex with scattered stiff setae, indentation on outer margin. Meso- and metatarsomeres with row of stiff setae on inner and outer margins; five tarsomeres present, protarsomere 1 compact, longer than protarsomeres 5, 2, 3 and 4, ranked respectively by length; terminal claws inwardly bent, claws three-quarters length of protarsomere.

Aedeagus (Figs. 8, 13): Parameres symmetrical, short, triangular; basal internal protuberance or lobe obtusely angulate in lateral view; abrupt and strong lateral protrusions in dorsal view; apical tips acute in dorsal view.

Variability. Length: 14.90–23.50 mm, width: 9.86–13.60 mm. Population from Mount Mabu differs from the coastal population as follows: Head. Frontal carina triangular, raised in the middle, forming an obtuse angle. Pronotum. Median depression deeper than in specimens from coastal region. Females are similar to males.

Differential diagnosis. The new species is morphologically similar to *Diastellopalpus infernalis* as both share a non-interrupted dorsal transversal carina on the pronotum and an unpunctate middle line in the posterior quarter of the pronotum. However, the lateral tips of the vertex carina of *D. infernalis* touch the lateral margins of the eyes, whereas, in *D. scholtzi*, new species, there is distinct space between the eyes and terminal margins of the vertex carina (compare Fig. 5 and Fig. 6). The pronotal sculpture of these two species is different: the surface of the new species is matt, smooth and finely punctate in the anterior half, while in *D. infernalis* the pronotal surface is shiny, rugose

and heavily punctate in the anterior half. Moreover, the genitalia of these two species are distinct (compare Figs. 8, 13 and Figs. 9, 14), as the new species has parameres with abrupt and strong lateral protrusions in dorsal view (Fig. 13), unlike simple shaped parameres in *D. infernalis*, in dorsal view (Fig. 14).

Comments: In Mozambique, *Diastellopalpus scholtzi*, new species can be confused with *D. orbigny* (Figs. 7, 26). The latter species can easily be separated from the new species by the presence of tridentate dorsal transverse carina (€-shaped) on the median pronotal depression, unlike the straight dorsal transverse carina in the new species (for more details see Table 1).

Biological note and distribution. The new species was collected in both summer and winter suggesting that the species is active throughout the year. The coastal population is associated with coastal sand forest, while the inland population has been collected in loamy sand under dense woodland and bamboo forest in the foothills of Mount Mabu (Fig. 32). The specimens from Mount Mabu were collected using pitfall traps baited with human excrement. The collecting method for the holotype is unknown but the paratype from Beira was trapped to a composite bait of buffalo and human dung.

Etymology. The species name is dedicated to Dr Clarke Scholtz, Emeritus Professor of Entomology at the University of Pretoria (UP), for his lifetime interest in scarab beetles. Furthermore, the first author would like to express his gratitude for his unconditional support and inestimable mentorship during his PhD studies at UP from 2015 to 2018.

Diastellopalpus infernalis van Lansberge, 1887

(Figs. 6, 9, 14, 18–23, 32)

Diastellopalpus infernalis van Lansberge, 1887: 109–110; d’Orbigny 1902: 311, 321; d’Orbigny 1908: 202, 206; d’Orbigny 1913: 584, 722; Marcus 1914: 210–211; Ferreira 1965: 1176; Ferreira 1967: 474, 479–480, 764; Ferreira 1972: 548, 1024; Josso & Prévost 2000: 20, 41, 102, 105; 112–113, 118; Davis & Scholtz 2010: 415, 421; Davis *et al.* 2008: 196, 267; Gillet & Barr 2018: 437.

Type locality: “Humpata Afr. occ” [Humpata, Huíla Province, Angola] (Fig. 29).

= *Diastellopalpus nyassicus* Kolbe, 1901: 73–74; Kolbe 1904: 292; d’Orbigny 1904: 328, 330; d’Orbigny 1908: 202, 207; d’Orbigny 1913: 722; Ferreira 1965: 1176; Ferreira 1967: 479; Ferreira 1972: 548; Josso & Prévost 2000: 41. (Junior subjective synonym confirmed).

Type locality: “Nord-Nyassa, Kivira-FLuss, Massewe” [Kivira River, Rungwe District and Kyela District, Mbeya Region, Tanzania].

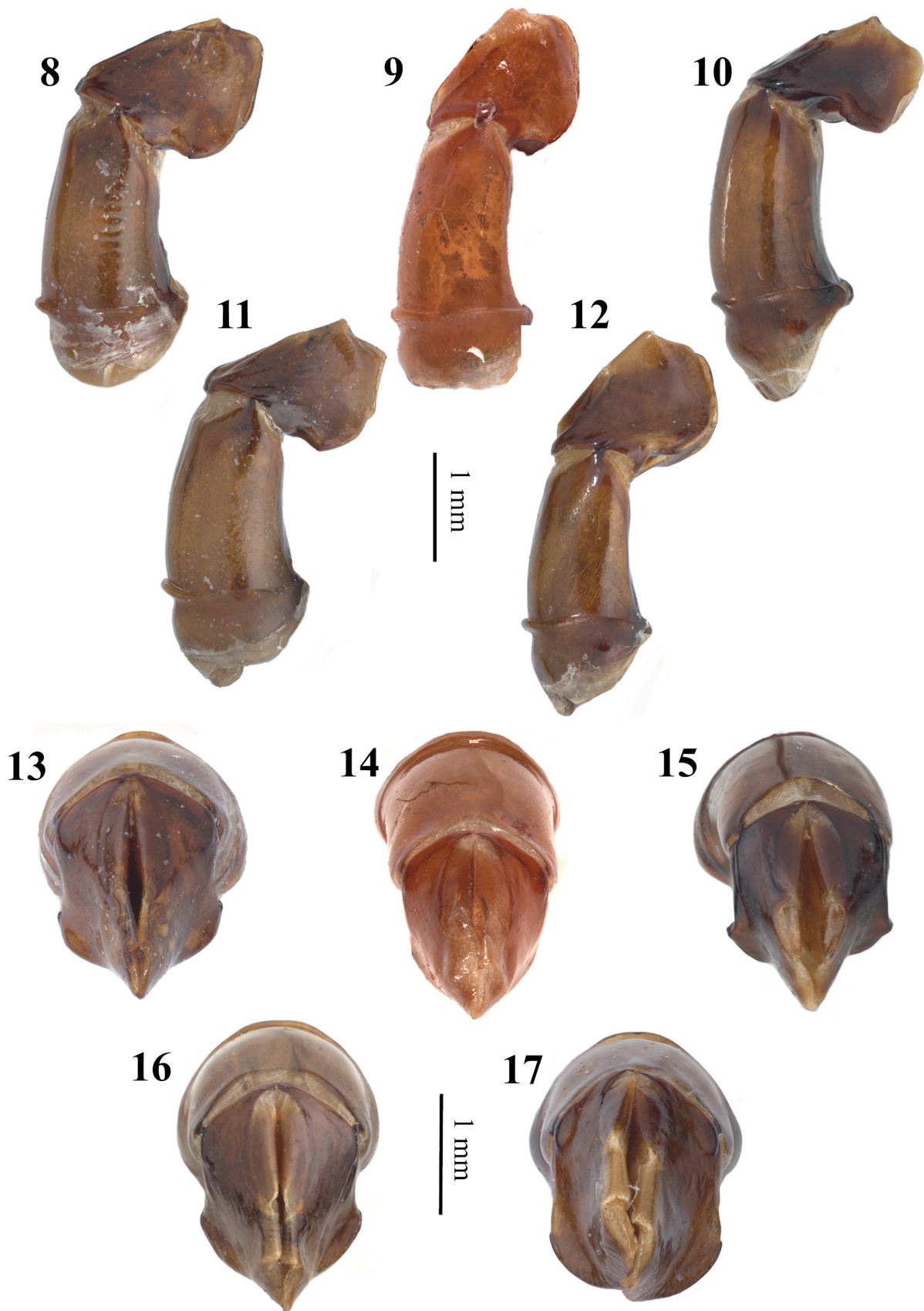
= *Onthophagus* (*Diastellopalpus*) *tridepressus* d’Orbigny, 1902: 309–312; d’Orbigny 1904: 328, 331; d’Orbigny 1913: 721, 723; Ferreira 1965: 1176; Ferreira 1967: 479; Ferreira 1972: 548; Josso & Prévost 2000: 41; d’Orbigny 1904: 328; Kolbe 1904: 292; d’Orbigny 1908: 202, 208; Péringuey 1904: 224. (Junior subjective synonym confirmed).

Type locality: “Nord du Mozambique: rivière Loudjenda [Lugenda River, northern Mozambique] (Fig. 32).

Type material examined

Diastellopalpus infernalis van Lansberge, 1887. **HOLOTYPE**, ♂ (RMNH) (Figs. 18–19): “vd. Kellen [Van der Kellen] | Humpata [Humpata, Huíla Province, Angola] | Afr. [Africa] occ [occidental]” || “type” || Onthop. [Onthophagus] (Diastel | lopalpus) | infernalis | Lansberge” || “Type” || “RMNH.INS. | 1483664” || “**HOLOTYPE:** *Diastellopalpus* | infernalis Van Lansberge, 1887 det. GM Daniel, 2023”.

Diastellopalpus nyassicus Kolbe, 1901. **LECTOTYPE**, here designated, ♂ (MFNB) (Figs. 20–21): “N. Nyassa- See [Lake Malawi, Tanzania] | Massewe-Kivira-FL [Kivirafluss = Kivira River, Rungwe District and Kyela District of Mbeya Region, Tanzania] | 25.XI. 99 [1899] | Goetze S.” || “73046” || “♂” || “tridepressus | d’Orbigny” || “nyassicus n.sp.” || “SYNTYPE | *Diastellopalpus* | nyassicus | Kolbe, 1901 | labelled by MFNB 2023” || “**LECTOTYPE:** *Diastellopalpus* | nyassicus Kolbe, 1901, des. GM Daniel, 2023”. **PARALECTOTYPES**, here designated, 2♂♂ (MFNB): “N. Nyassa-See [Lake Malawi, Tanzania] | Konde-Unyika [Northern tip of Lake Malawi, Mbeya and Njombe Region, Tanzania] | I. 00 | Fülleborn S.” || “75171” || “♂” || “SYNTYPE | *Diastellopalpus* | nyassicus | Kolbe, 1901 | labelled by MFNB 2023” || “**PARALECTOTYPE:** *Diastellopalpus* | nyassicus Kolbe, 1901, des. GM Daniel, 2023”.



FIGURES 8–17. Male genitalia, lateral view (8–12) and dorsal (13–17). *Diastellopalpus scholtzi* Daniel, Strümpher, Josso & Davis new species, holotype (8, 13); *Diastellopalpus infernalis* van Lansberge, 1887 (9, 14); *Diastellopalpus neavei* (d’Orbigny, 1914) (10, 15); *Diastellopalpus orbigny* Péringuey, 1904, valid species (11, 16); *Diastellopalpus quinquedens* Bates, 1888 (12, 17). Photos by W.P. Strümpher (8, 10–12, 13, 15–17) and J.-F. Josso (9, 14).

Onthophagus (Diastellopalpus) tridepressus d'Orbigny, 1902. **LECTOTYPE**, here designated, **LECTOTYPE**, here designated, ♂ (MNHN) “Région de M’Pala | Tanganika | R.P. Guillemé” || “TYPE” || “LECTOTYPE: *Onthophagus (Diastellopalpus) tridepressus* | d’Orbigny, 1902, | des. GM Daniel, 2023”. **PARALECTOTYPES**, here designated, 2♂♂, 5♀♀ (MNHN) same data as lectotype, except: “**PARALECTOTYPE: *Onthophagus (Diastellopalpus) tridepressus* | d’Orbigny, 1902, | des. GM Daniel, 2023”**. 1♀ (MNHN) (Figs. 22–23): “R. Lujenda | E. Africa” || “Ex.Musæo | H.W.BATES | 1892 [vertical]” || “H. d’Orbigny | Onth. Afr. 1902” || “TYPE” || “LECTOTYPE: *Onthophagus (Diastellopalpus) tridepressus* d’Orbigny, 1902, des. GM Daniel, 2023”. 1♂ (MNHN). “Nyassaland | RP. Guillet” || *tridepressus* | *n.sp. d’Orb.*” || “H. d’Orbigny | Onth. Afr. 1902” || “TYPE” || “LECTOTYPE: *Onthophagus (Diastellopalpus) tridepressus* d’Orbigny, 1902, | des. GM Daniel, 2023”.

Additional material examined (45 specimens): ANGOLA: 1♂ “Angola / Huambo // Museum Paris / ex Coll. / R. Oberthur” (MNHN). **DEMOCRATIC REPUBLIC OF THE CONGO:** 1♀, 3♂♂ “[Congo Belge | Lulua: Kapanga | coll. Ch. De Wyngaert” || “CNHM 1960 | Purchased ex Ch. de Wyngaert (FMNH)”. 1♀ “MUKOMA | Rep. Democ. CONGO | IV-1998 | M. LUMPUNGU réc.” || “*Diastellopalpus | infernalis* Lansb.” (JFJC). **MALAWI:** 1♂ “Nyassaland / R.P. Guillet // MUSEUM PARIS / Coll. H. d’ORBIGNY / 1915 // nyassicus / Kolbe” (MNHN). 3♂♂, 2♀♀ “MALAWI 1700 m | LUWAWA South VIPHYA | 21-I-2001 | J-F Josso réc.” || “Exc. | HUMAINS” || “*Diastellopalpus | infernalis* Lansberge | J-F Josso det. 2014” (JFJC). 1♀ “C MALAWI | CHIMALIRO Forest | KASUNGU District | Sud de Viphya 1300 m | 16-I-2001 | J-F Josso réc.” || “Exc. | HUMAINS” (JFJC). 1♂ “MALAWI | NKHORONGO | MZUZU 1380 m | XII-1995 | R. Murphy leg.” (JFJC). 5♂♂, 1♀ “MALAWI | NYIKA NP 1700m | 9 km N Thazima Gate | 15-XII-2006 | Josso Juhel Monfort leg” || “Exc. | HUMAINS” (JFJC). **TANZANIA:** 1♂, 1♀ “Manow / D.O. Africa // MUSEUM PARIS / Coll. H. d’ORBIGNY / 1915” (MNHN). 1♀ “Afr. or. all. / Manow // MUSEUM PARIS / Coll. H. d’ORBIGNY / 1915” (MNHN). 2♂♂, 2♀♀ “Ubemba / R.P. Guillemé // MUSEUM PARIS / Coll. H. d’ORBIGNY / 1915” (MNHN). 3♂♂ “afr. or. allem. // MUSEUM PARIS / 1936 / Coll. A. BOUCOMONT” (MNHN). 1♂ “afr. or. allem. // MUSEUM PARIS / 1936 / Coll. A. BOUCOMONT // (*Diastell.*) / *infernalis* / Lansb.” (MNHN). **UGANDA:** 1♀ “Entebbe, Uganda | Centr. Afri. | H. Rolle, Bertn.SW.” || “CNHM | 1955 | Karl Brancsik Colln. | ex Eduard Knirsch” || “*Diastellopalpus | infernalis* Lansb | det. F. S. 1959” || “*Diastellopalpus | infernalis* Lansb | F. Pereira det. [19]59” (FMNH). **ZAMBIA:** 1♀ “ZAMBIE (E Mongu) | piste de NDANDA | 15°07’25,4”S | 23°41’23,1”E | 10-XII-2008 | JF Josso R Minetti leg” || “Exc. | HUMAINS” (JFJC). 1♂ “ZAMBIE | Kafue NP Kacheleko | wildlife outpost | 02–03-XII-2007 | Josso Juhel Monfort leg” || “Exc. | HUMAINS” || “*Diastellopalpus | infernalis* Lansberge | J-F Josso det. X 2008” (JFJC). 1♂, 1♀ “ZAMBIE | Kafue NP Kacheleko | wildlife outpost | 16–17-XII-2008 | JF Josso R Minetti leg” || “Exc. | HUMAINS” (JFJC). 2♀♀ “ZAMBIE | KAFUE NP | route principale | 16–17-XII-2008 | JF Josso R Minetti leg” || “Exc. | ELEPHANTS” (JFJC). 1♂ “ZAMBIE | Kafue NP Kacheleko | wildlife outpost | 10–18-XII-2009 | Josso Juhel Minetti leg” || “Exc. | HUMAINS” (JFJC). 4♂♂, 2♀♀ “ZAMBIE NW Prov. | Ikelenge Nchila Game | Reserve. 07–08-XII-2012 | S11°16’ E24°19’ 4909ft | leg. Josso Juhel Minetti” || “Exc. | HUMAINS” (JFJC).

Redescription

Size: Length: 18.00–21.2 mm. Width: 11.00–12.2 mm.

Colour (Figs. 6, 18, 20, 22): Dorsal black. Ventral dark brown.

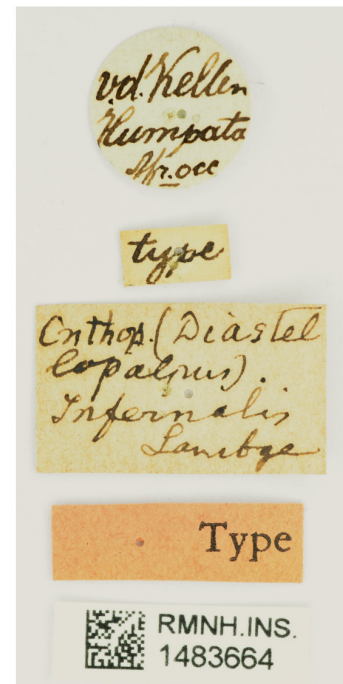
Head (Figs. 6, 18, 20, 22): Arcuate, surface of anterior edge dull and rugose with transverse wrinkles; surface of posterior edge smooth and shiny with ocellate punctures, each puncture bearing minute seta. Clypeus distinctly arcuate and marginate comprising a broad, continuous unpunctate strip. Fronto-clypeal suture faintly visible, clypeo-genal margin continuously rounded, genae slightly protruding externally. Frons with transverse carina raised in the middle; transverse vertex carina with lateral tips touching lateral margins of eyes.

Pronotum (Figs. 6, 18, 20, 22): Convex, wider than long, surface glossy, rugose on antero-lateral edge of pronotal disc, otherwise smooth; uniformly punctate, except on anterior half of unpunctate medial line and faintly punctate posterior half comprising very shallow punctures; punctures bearing fine, short, brownish setae. Anterior part of pronotum deeply excavated, forming three deep depressions; depression surface shiny with sparse granules; median depression separated from two lateral depressions by two longitudinal carinae; median depression with faint longitudinal medial line; anterior part of pronotal disc with distinct straight transverse carina; lateral depressions each with distinct lateral slightly projected, tooth-like tubercle.

18



19



5 mm

HOLOTYPE: *Diastellopalpus infernalis* Van Lansberge, 1887, det. GM Daniel, 2023

FIGURES 18–19. *Diastellopalpus infernalis* van Lansberge, 1887, holotype (RMNH). 18, habitus, dorsal view; 19, labels. Photos courtesy of Yvonne van Dam, copyright RMNH.

Elytra (Figs. 18, 20, 22): Shorter in length than combined width, with eight striae. Interstriae glossy, smooth, punctate and finely setose, except for rugosity on anterior quarter of interstriae 6–7; interstria 1 narrower than others, interstria 2 wider than others, remainder equal in width; interstriae 7–8 with ill-defined humeral callus.

Prosternum and propleuron: Surface shiny with a few irregular setae.

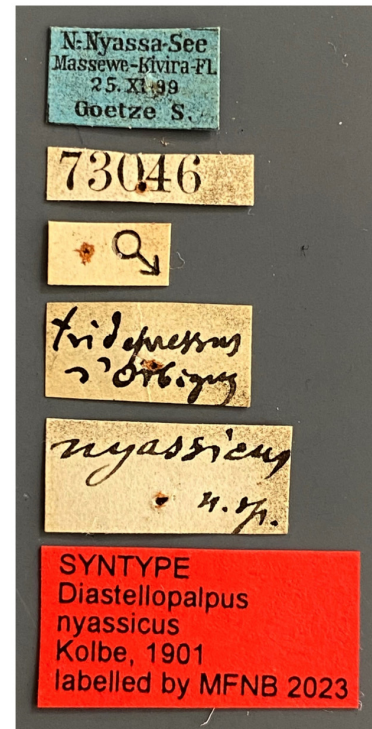
Ventrites: Mesoventrite surface dull, fully setose with few irregular punctures. Mesometaventral suture weakly rounded. Metaventrite surface shiny; irregularly punctate mid-posteriorly, unpunctate anteriorly.

Pygidium: Surface glossy, densely punctate with medium-sized punctures bearing setae.

Legs (Figs. 18, 20, 22): Between dorsal and ventral surface profemoral margins with row of strong setae; dorsal surface shiny and glabrous, lateral edge with few punctures; ventral surface shiny, faintly punctate; upper anterior and posterior edges strongly marginate. Protibiae slender basally and stouter apically, four triangular teeth present on outer margin, basal tooth ill-defined; edge between teeth strongly concave; lateral row of stiff setae present on inner margin, two parallel rows of fine setae present on outer margin. Protibial spur inwardly curved. Protarsi with five visible cylindrical tarsomeres; protarsomere 5 longer than equally-sized protarsomeres 1–4. Meso- and metafemora complanate, strongly compact, mesofemora shorter than metafemora; surface shiny, punctate on posterior and lateral edges with few setae, otherwise unpunctate. Meso- and metatibiae flattened, gradually expanded almost to apex with scattered stiff setae, indentation on outer margin. Meso- and metatibiae with two or single projecting spurs on inner margin, respectively. Meso- and metatarsomeres with five tarsomeres, row of stiff setae present on inner and outer margins; meso- and metatarsomere 1 compact, longer than meso- and metatarsomeres 5, 2, 3 and 4, ranked respectively by length, meso- and metatarsomere 5 adjacent to pair of tiny apical claws.



21



LECTOTYPE: *Diastellopalpus nyassicus* Kolbe, 1901, des. GM Daniel, 2023

FIGURES 20–21. *Diastellopalpus nyassicus* Kolbe, 1901 (= junior subjective synonym of *Diastellopalpus infernalis*), lectotype (MFNB). 20, habitus, dorsal view; 21, labels. Photos courtesy of Bernd Jaeger, copyright MFNB.

Aedeagus (Figs. 9, 14): Parameres symmetrical, short, ill-triangularly shaped, basal internal protuberance or lobe obtusely angulate in lateral view; parameres simple in dorsal view (lacking abrupt and strong lateral protrusions); apical tips acute in dorsal view.

Variability. Females are similar to males but they differ by having a frontal carina not raised in the middle and a pronotum with often distinct concave transverse carina.

Differential diagnosis. See the diagnosis of *Diastellopalpus scholtzi*, new species and Table 1.

Taxonomic notes: The description of *D. infernalis* is based on a single individual collected by explorer Pieter Jacob van der Kellen (1895–1966), who took part in the Dutch Ethnographic Museum’s expedition in southern Angola during 1884–1885 (van Lansberge 1887: 110). This makes this sole male specimen the holotype of the nominal species, *D. infernalis* fixed by monotypy, following Article 73.1.2 of the *Code*.

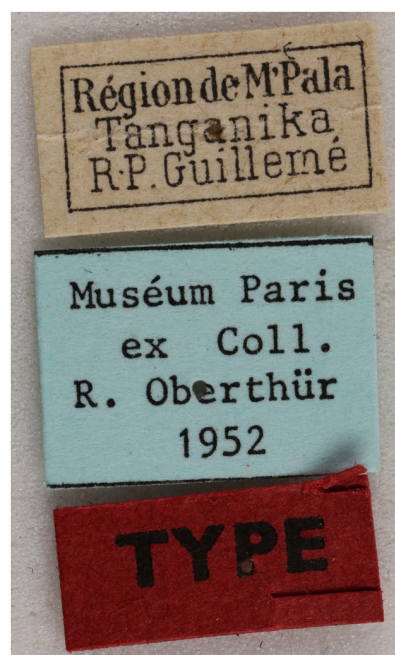
Two junior subjective synonyms remain recognised for *D. infernalis*, all originally proposed by d’Orbigny (1904, 1908) in his extensive works on African Onthophagini. Firstly, *D. tridepressus* d’Orbigny, 1902, was synonymized with *D. nyassicus* Kolbe, 1901 (d’Orbigny 1904: 328). Later, *D. nyassicus* was synonymized with *D. infernalis* by d’Orbigny (1908: 202). Further, d’Orbigny (1913: 723) also regarded *Diastellopalpus orbignyi* as a junior subjective synonym of *D. infernalis*. However, based on morphological and biogeographical evidences (Table 1), we revalidated *D. orbignyi*.

Biological note and distribution. *Diastellopalpus infernalis* is distributed primarily on southerly-lying tropical highlands from the western to the eastern seaboard of Africa. It is associated with dense woodlands in the following countries: Angola, Democratic Republic of the Congo, Malawi, northern Mozambique (Niassa Province; Fig. 32), Tanzania, Zambia (Davis & Scholtz 2010; Josso & Prévost 2000).

22



23



LECTOTYPE: *Onthophagus*
(*Diastellopalpus*)
tridepressus d'Orbigny, 1902,
des. GM Daniel, 2023

FIGURES 22–23. *Onthophagus* (*Diastellopalpus*) *tridepressus* d'Orbigny, 1902 (= junior subjective synonym of *Diastellopalpus infernalis*), Lectotype (MNHN). 22, habitus, dorsal view; 23, labels. Photos courtesy of Olivier Montreuil, copyright MNHN.

Diastellopalpus neavei (d'Orbigny, 1914), new country record

(Figs. 10, 15, 24–25, 32)

Onthophagus (*Diastellopalpus*) *neavei* d'Orbigny, 1914: 460; d'Orbigny 1915: 399, 401; Cambefort & Mauchamp 1980: 180; Josso & Prévost 2000: 20, 58, 101, 103, 112–113, 119; Davis & Scholtz 2010: 419.

Type locality: “Nyasaland, Mlanje” [Malawi, Southern Region, Mulanje].

Type material examined

LECTOTYPE ♂ (MNHN) (Figs. 24–25): “Nyasaland. [Malawi] | Mlanje. | May 6, 1913. | S.A.Neave. | 1913–40.” || “*neavei* d'Orb. [d'Orbigny's handwriting]” || “LECTOTYPE” || “LECTOTYPE | *Diastellopalpus* | *neavei* d'Orb. | Y. CAMBEFORT det. 1980” || “Museum Paris | Coll. H. d'Orbigny | 1915”.

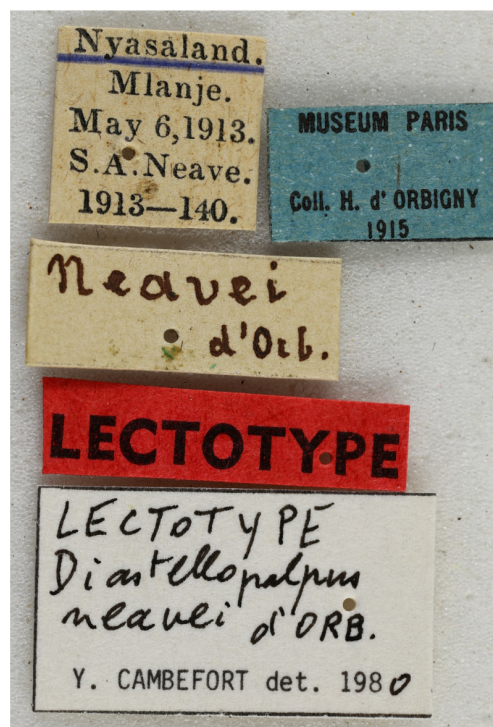
Additional material examined (578 specimens): MALAWI: 3♂♂, 3♀♀ “S MALAWI | Mt MULANJE 950 m | 25–26-I-2001 | J-F Josso réc.” || “Exc. | HUMAINS” (JFJC). **MOZAMBIQUE:** 2♂♂, 3♀♀, BMSA(C) 138131–138132; 138185–138186: “MOZ [Mozambique]: Zambézia [Province] | Mabu Forest, Mt. | Mabu Foothills, Trans. [Transect] 12 | 16°17'04”S, 36°23'43”E | 18–20.iv.2022, 109 m | Daniel, Nganhane & Strumpher” || “Hum. [Human] dung pitfall trap | Dense Woodland & Bamboo | Forest” || “Terres. Invert. Dept. | National Museum | P.O. Box 266 | Bloemfontein 9300 | South Africa” (BMSA). 7♂♂, 6♀♀, BMSA(C) 138188–138200: Same data except: “Mabu, Trans. [Transect] 1 | 16°16'37”S, 36°22'49”E | 15–19.iv.2022, 1355 m” || “Hum. [Human] dung pitfall trap | Afromontane | Forest” (BMSA). 2♂♂ same date (TMSA). 13♂♂, 20♀♀, BMSA(C) 138324–138330, 138341–

138462; 138539–138542: same data, except: “Mabu, Trans. [Transect] 2 | 16°16'38”S, 36°22'51”E | 15–19.iv.2022, 1334 m || Hum. [Human] dung pitfall trap | Afromontane | Forest ||” (BMSA). 2♂♂, 2♀♀ same date (TMSA). 6♂♂, 3♀♀, BMSA(C) 138397–138405: same data, except: “Mabu, Trans. [Transect] 3 | 16°16'37”S, 36°22'46”E | 15–19.iv.2022, 1334 m || “Hum. [Human] dung pitfall trap | Afromontane | Forest” (BMSA). 22 unsexed, same data (TMSA). 18♂♂, 10♀♀, BMSA(C) 138563–138565, 139932–139951, 139977–139981): same data, except: “Mabu, Trans. [Transect] 4 | 16°16'38”S, 36°22'45”E | 15–19.iv.2022, 1350 m” || “Hum. [Human] dung pitfall trap | Afromontane | Forest” (BMSA). 4♂♂, 4♀♀ same date (TMSA). 89♂♂, 59♀♀, BMSA(C) 138331–138348, 138406–138440, 138566–138622, 140031–140068: same data, except: “Mabu, Trans. [Transect] 5 | 16°16'33”S, 36°22'44”E | 16–19.iv.2022, 1360 m” || “Hum. [Human] dung pitfall trap | Afromontane | Forest” (BMSA). 7♂♂, 6♀♀ same date (TMSA). 49♂♂, 99♀♀, BMSA(C) 138463–138523, 140005–140030: same data, except: “Mabu, Trans. [Transect] 6 | 16°16'28”S, 36°22'37”E | 16–19.iv.2022, 1330 m” || “Hum. [Human] dung pitfall trap | Afromontane | Forest” (BMSA). 27 unsexed, same date (TMSA). 40♂♂, 38♀♀, BMSA(C) 138349–138359, 138524–138562, 139982–140002, 140075–140085: same data, except: “Mabu, Trans. [Transect] 7 | 16°16'51”S, 36°22'57”E | 16–19.iv.2022, 1400 m” || “Hum. [Human] dung pitfall trap | Dense woodland & | bamboo forest” (BMSA). 20♂♂, 24♀♀ BMSA(C) 138252–138271: same data, except: “Mabu, Trans. [Transect] 10 | 16°16'45”S, 36°22'04”E | 17–20.iv.2022, 1200 m” || “Hum. [Human] dung pitfall trap | Afromontane | Forest” (BMSA). 17♂♂, 20♀♀, BMSA(C) 138360–138396: same data, except: “Mabu, Trans. [Transect] 11 | 16°17'35”S, 36°22'21”E | 17–20.iv.2022, 1200 m” || “Hum. [Human] dung pitfall trap | Afromontane | Forest” (BMSA). 1♂, same data, except: “Mabu, Trans. [Transect] 6 | 16°16'28”S, 36°22'37”E | 16–19.iv.2022, 1330 m” || “Hum. [Human] dung pitfall trap | Afromontane | Forest” (JFJC). 1♂, same data, except: “Mabu, Trans. [Transect] 5 | 16°16'33”S, 36°22'44”E | 16–19.iv.2022, 1360 m” || “Hum. [Human] dung pitfall trap | Afromontane | Forest” (JFJC).

24



25



5 mm

FIGURES 24–25. *Diastellopalpus neavei* (d’Orbigny, 1914), lectotype (MNHN). 24, habitus, dorsal view; 25, labels. Photos courtesy of Olivier Montreuil, copyright MNHN.

Redescription

Size: Length: 17.10–24.6 mm, width: 14.5–10.7 mm.

Colour (Fig. 24): Black.

Head (Fig. 24): Arcuate, surface dull, rugose with large ocellate punctures, each puncture bearing black seta. Clypeus arcuate and continuously marginate with broad, shagreened strip. Clypeo-genal suture faintly visible, genae slightly protruding externally. Frontal carina slightly arcuate; vertex with long coniform horn, wider basally and narrower terminally.

Pronotum (Fig. 24): Wider than long, surface smooth mid-posteriorly, rugose antero-laterally, inconspicuously metallic and shiny, punctures irregularly spaced on anterior and central disc, otherwise unpunctate; punctures with sparse short setae. Anterior angles outwardly projected. Pronotal disc with concave median projection subdentate on each side. Anterior part of pronotum with three depressions; longitudinal carinae separate shallow median depression from deep lateral depressions; distinct tooth-like tubercle strongly projected at lateral edge of lateral depressions in dorsal view.

Elytra (Fig. 24): Shorter in length than combined width, with eight well-marked striae. Interstriae shiny, finely punctate, punctures spaced regularly with short setae; interstria 1 narrower than others, interstria 2 wider on anterior three-quarters and narrower on posterior one-quarter. Interstriae 7–8 with ill-defined humeral callus.

Prosternum and propleuron: Surface dull, with a few irregular sets of setae.

Ventrites: Mesoventrite shiny, with fine long setae laterally, unpunctate and glabrous medially. Mesometaventral suture sinuate postero-medially. Metaventricle shiny, irregularly punctate with scattered long setae, except, on medial line, unpunctate and glabrous.

Pygidium: Dull, irregularly punctate with few setae.

Legs: Between dorsal and ventral surface, profemoral margins with row of long, strong setae; dorsal and ventral surface smooth, shiny, and glabrous, lateral surface punctate; upper anterior and posterior edges strongly marginate. Protibiae slender basally and stouter apically, four triangular teeth present on outer margin; edge between teeth weakly sinuate. Lateral row of stiff setae present on inner margin, two parallel rows of fine setae present on outer margin. Protibial spur inwardly curved. Protarsomere 5 longer than protarsomeres 1–4, which more or less equal in size. Meso- and metafemora complanate, surface shiny, glabrous, faintly punctate; posterior margin with distinct apical-basal longitudinal depression. Mesofemora shorter than metafemora. Meso- and metatibiae flattened, gradually expanded almost to apex with scattered stiff setae, indentation on outer margin. Meso- and metatarsomeres with five tarsomeres, meso- and metatarsomere 1 compact, longer than meso- and metatarsomeres 5, 2, 3 and 4, ranked respectively by length, row of stiff setae on inner and outer margins.

Aedeagus (Figs 10, 15): Parameres symmetrical, short, trapezoidal-shaped, basal internal lobe forming rectangle, apical tips truncate without any cleft in lateral view.

Variability. Females differ from males as follows: Head: transverse frontal carina straight. Vertex with four, rough, transverse tubercles in line, lateral tubercles smaller than medial. Horn absent. Pronotal surface entirely and densely punctate; pronotal disc depressions shallow, carinae and tubercles weakly developed.

Differential diagnosis. *Diastellopalpus neavei* is somewhat similar to *D. metriogonus* but the shape of the elytral interstriae would separate these two species. The former species has almost flat elytral interstriae, while the latter species has distinctly convex elytral interstriae.

Taxonomic notes. Specimens of *Diastellopalpus* collected from Mulanje, Malawi, by S.A. Neave in 1913 were provided with the name *D. neavei* by d'Orbigny (1914: 460). Although they seemed to be the same species as *Diastellopalpus metriogonus*, described from Tanzania by Marcus (1914: 209); they were left labeled as *D. neavei* but without a published description. Subsequently, d'Orbigny (1915: 399) recognized *D. neavei* as a definite junior subjective synonym of *D. metriogonus*. However, lacking a published description, the name *D. neavei* (d'Orbigny 1914: 460) constitutes only a *nomen in litteris*.

Much later, Cambefort & Mauchamp (1980) examined the type material of *D. metriogonus* and the specimens labeled as *D. neavei nomen in litteris*, which were presented as types by d'Orbigny (1914). Upon discovering that they represented two distinct species, Cambefort & Mauchamp (1980: 180) provided a description for *D. neavei* and correctly attributed the authorship to d'Orbigny (1914), following Article 50.7 of the *Code*. This article states that "If a scientific name (taken, for example, from a label or manuscript) was first published as a synonym of an available name and became available before 1961 through the provisions of Article 11.6 of the *Code* [which is the

present case], then its author is the person who published it as a synonym, even if some other originator is cited, and is not the person who subsequently adopted it as a valid name”.

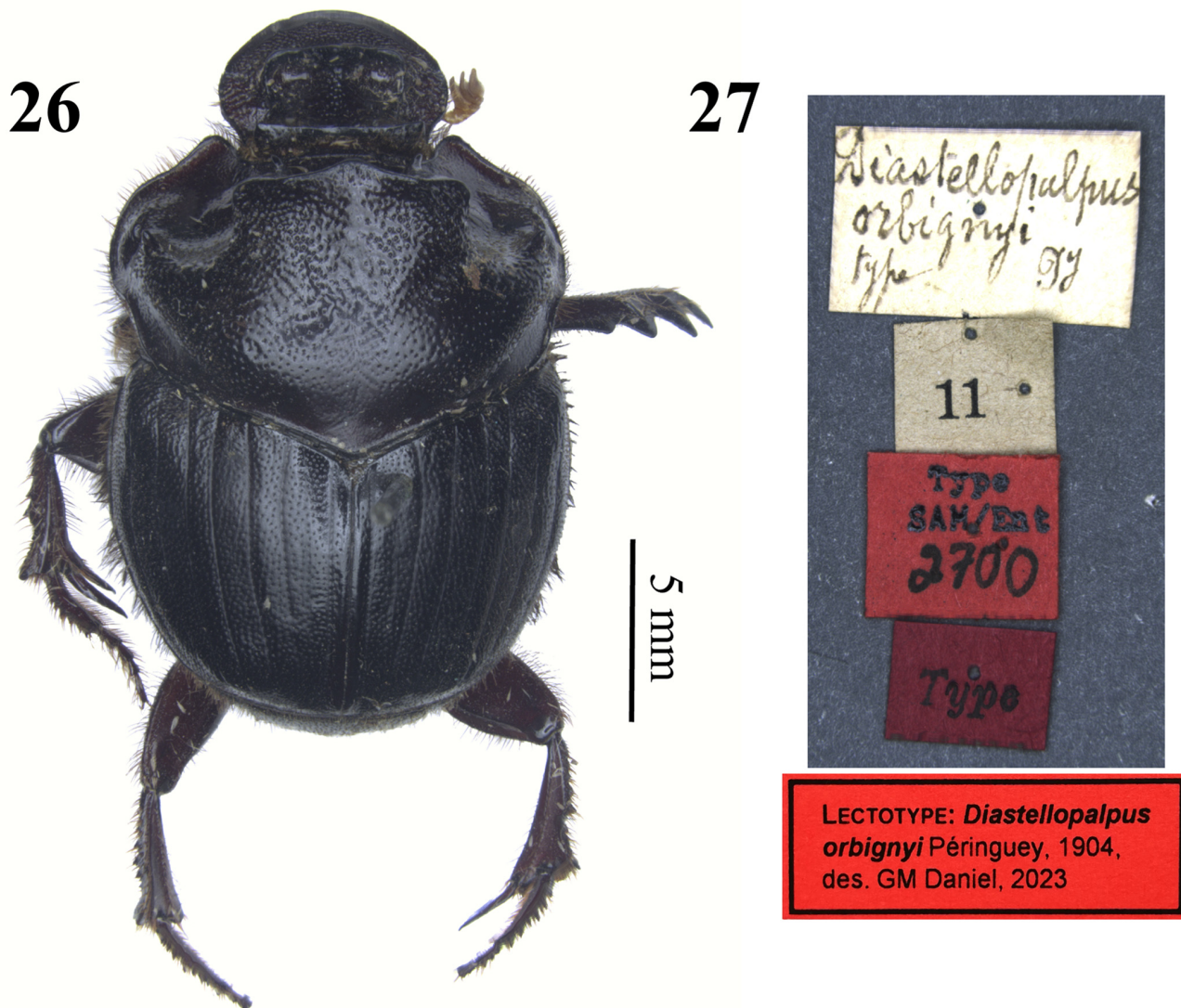
Biological note and distribution. *Diastellopalpus neavei* is only known from upland areas of Mulanje (Malawi) and Mount Mabu (Mozambique) (Fig. 32). As a first-country record for this species in Mozambique, it has been collected in high numbers on Mount Mabu during late summer using pitfall traps baited with human excrement. On Mount Mabu, *D. neavei* is associated with loamy sand in dense woodland, Afromontane rainforest, and bamboo forest.

***Diastellopalpus orbigny* Péringuey, 1904, valid species**

(Figs. 7, 11, 16, 26–27, 32)

Diastellopalpus orbigny Péringuey, 1904: 224–225; Péringuey, 1908: 626–627; d’Orbigny, 1913: 723; Ferreira, 1965: 1176; Ferreira, 1967: 479; Ferreira, 1972: 548; Josso & Prévost, 2000: 41.

Type locality: “Southern Rhodesia (Umtali and Gasaland)” [Mutare and Gazaland, Manicaland, Zimbabwe].



FIGURES 26–27. *Diastellopalpus orbigny* Péringuey, 1904, status revalidated, lectotype (SAMC). 26, habitus, dorsal view; 27, labels. Photos courtesy of G.M. Daniel, copyright SAMC.

Type material examined

Diastellopalpus orbigny Péringuey, 1904. LECTOTYPE, here designated, ♂ (SAMC) (Figs. 26–27): “Diastellopalpus | orbigny | type | PL [Péringuey’s handwriting]” || “11” || “Type” | SAM/Ent | 2700” || “Type” || “LECTOTYPE: *Diastellopalpus* | *orbigny* Péringuey, 1904, des. GM Daniel, 2023”.

Additional material examined (113 specimens): MOZAMBIQUE: 1♀ “GORONGOSA MTN., [mountain] | Mozam. [Mozambique] (1100 m) | 25.I.72 [1972] | Bornemissza & Kirk” || DBRU label missing? || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “Diastellopalpus | infernalis | van Lansberge, 1887 | det. ALV. Davis, 2014” || “SANC—Pretoria | Database No: | COLS30542” (SANC). 1♀ “VILA DE MANICA. Mozam [Mozambique] | (18 mi[les] E 10.IV.[19]71 | Bornemissza & Aschenborn” || “109” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08321” (SANC). **ZIMBABWE:** 1♀ “MAKUTI, ZIMB. [Zimbabwe] | 7.I.[19]82 | Doube & Macqueen” || “2552” || “SANC—Pretoria | Database No: | COLS08325” (SANC). 1♀ “MAKUTI, ZIMB. [Zimbabwe] | 7. I. 82 [1982] | Doube & Macqueen” || “2552” || “*Diastellopalpus* | *infernalis* | van Lansberge, 1887 | det. ALV. Davis, 2014” || “SANC—Pretoria | Database No: | COLS08325” (SANC). 1♀ “BANKET, Rhod. [Rhodesia] | 5.II.[19]72 | A.A. Kirk” || “360” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08327” (SANC). 1♂ “Christon Bank | S. RHODESIA | May 1972 | A. J. DUKE” || “TM SOUTH AFRICA | TMSC14058” (TMSA). 3♂♂ “SALISBURY [=Harare], Rhod [Rhodesia] | (20 mi[les] S) 7.IV.[19]71 | Bornemissza & Aschenborn” || “91” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08326” (SANC). 2♂♂ “SALISBURY [=Harare], Rhod [Rhodesia] | (15 mi[les] E) 8.IV.[19]71 | Bornemissza & Aschenborn” || “90” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08328” (SANC). 1♀ “SILVERSTREAMS RIV. BRIDGE | (3 mi[les] N) 21.IV.[19]71 | Rhodesian Highlands | Bornemissza & Aschenborn” || “144” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08317” (SANC). 1♀ “SILVERSTREAMS RIV. | BRIDGE, Rhod. [Rhodesia] | (3 mi[les] N) 5.I.[19]72 | Bornemissza & Kirk” || “321” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08318” (SANC). 1♂ “SILVERSTREAMS RIV., | Rhod [Rhodesia] 20.I.[19]74 | H.H. Aschenborn” || “1372” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08323” (SANC). 1♂ “MARANDELLAS [= Marondera], Rhod [Rhodesia] | 8.IV.[19]71 | Bornemissza & Aschenborn” || “99” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “Diastellopalpus | Onthophagus | infernalis | La | det.G.Frey, 1974” || “SANC—Pretoria | Database No: | COLS08322” (SANC). 1♂ “PENHALONGA [Penalunga] Rhod [southern Rhodesia] | 16/17.iv.1973 | H.H. Aschenborn” || “1146” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “*Diastellopalpus* | *infernalis* | van Lansberge, 1887 | det. ALV. Davis, 2014” || “SANC—Pretoria | Database No: | COLS08330” (SANC). 1♂ “UMTALI, Rhod [Rhodesia] | (22 mi[les] N) 9.IV.1971 | Bornemissza & Aschenborn” || “133a” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08320” (SANC). 1♂ “Bompani, Vumba | S. RHODESIA | 23/11/[19]74 | N. J. DUKE” || “Diastellopalpus | infernalis | LANSB.” || “TM SOUTH AFRICA | TMSC14057” (TMSA) (Figs. 7, 11, 16). 1♂ “CHIPINGA, Rhod. [Rhodesia] | (20 mi[les] N) 20.IV.[19]71 | collectors?” || “137” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “*Diastellopalpus* | *infernalis* | Van Lansberge, 1887 | det. ALV. Davis, 2014” || “SANC—Pretoria | Database No: | COLS08324” (SANC). 1♂ same data but with additional label “Diastellopalpus | infernalis | Onthophagus | La” (SANC). 1♂ “CHIPINGA, Rhod. [Rhodesia] | (6 kms [kilometres] S) 19.I.[19]74 | H.H. Aschenborn” || “1376” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08329” (SANC). 1♂, 1♀ “CHIPINGA, Rhod. [Rhodesia] | (4 mi[les] SE) 19.I.[19]76 | 1100m | A.L.V. Davis” || “2205” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08315” (SANC). 1♂ “CHIRINDA FOREST, Rhod. [Rhodesia] | (32 kms SE Chipinga | 19.I.[19]76 875 m” | A.L.V. Davis” || “2203” || “Ex Coll CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08316” (SANC). 1♂ “[outhern]. Rhodesia | Mount Selinda. | Chirinda Forest. | 3, 500 ft | 15–26.I.1959 | A.C. van Bruggen.” || “NATIONAL COLL. | OF INSECTS | Pretoria,S.Afr || *Onthophagus* (*Diastello-* | *palpus*) *infernalis* | Van Lansberge 1887 | det. A.L.V. Davis, 1981” || “*Diastellopalpus* | *infernalis* | Van Lansberge, 1887 | det. ALV Davis, 2014” || “SANC—Pretoria | Database No: | COLS30543” (SANC). 2 unsexed “S. Rhodesia. [=Zimbabwe] | Mount Selinda. | Chirinda Forest. | 3, 500 ft | 6–8.II.1959 | A.C. van Bruggen.” || “NATIONAL COLL. | OF INSECTS | Pretoria,S.Afr || *Onthophagus* (*Diastello-* | *palpus*) *infernalis* | Van Lansberge 1887 | det. A.L.V. Davis, 1981” ||

“*Diastellopalpus | infernalis* | Van Lansberge, 1887 | det. ALV Davis, 2014” || “SANC—Pretoria | Database No: | COLS30543” (SANC). 1♀ “Mt.SELINDA | 1–17.IV.1956 | G. van Son” || “TM SOUTH AFRICA | TMSC09889” (TMSA). 2♀♀ “Mt.SELINDA | 17–31.VI.1956 | G. van Son” || “TM SOUTH AFRICA | TMSC09888” (TMSA). 1♂ “Mt. Selinda.Rh. [Rhodesia] | 3–17.I.1962 | G. van Son” || “TM SOUTH AFRICA | TMSC09890” (TMSA). 1♂ “Mnt. SELINDA | S. RHOD. [Rhodesia], XII- | 1935,G.van Son” || “TM SOUTH AFRICA | TMSC09887” (TMSA). 1♀ “Chirinda F. [Forest] | XII.[19]52. vSon” || “TM SOUTH AFRICA | TMSC09890” (TMSA). 8 unsexed “KYLE DAM, Rhod. [Rhodesia] | (10 kms [kilometres] NW) 16.I.[1976] | A.L.V. Davis” || “2192” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08314” (SANC). 8♂♂, 2♀♀ “ZIMBABWE Manicaland | Chimanimani Fst | S19°46,437’ E32°53,032’ | 15–16-XII-2018 1128m | leg. Josso Juhel Houé” || “Exc. | HUMAINS” (JFJC). 1♂ “ZIMBABWE Manicaland | 10 km W Juliasdale | S18°20,960’ E32°37,404’ | 18-XII-2018 1892m | leg. Josso Juhel Houé” || “Exc. | HUMAINS” (JFJC). 4♂♂, 4♀♀ “ZIMBABWE Manicaland | Nyati Eco Park | S18°17,448’ E31°57,216’ | 19–21-XII-2018 1540m | leg. Josso Juhel Houé” || “Exc. | HUMAINS” (JFJC). 24♂♂, 22♀♀ “ZIMBABWE Manicaland | Chirinda Fst Selinda Mt | S20°24,621’ E32°41,961’ | 13–14-XII-2018 1177m | leg. Josso Juhel Houé” || “Exc. | HUMAINS” (JFJC). 1♂ “ZIMBABWE Manicaland | Bvumba Mts 1106m | S19°04,16’ E32°50,15’ | 09-XII-2018 | leg. Josso Juhel Houé” || “Exc. | HUMAINS” (JFJC). 4♂♂, 1♀ “ZIMBABWE Manicaland | Bvumba Mts Burma Valley | S19°08,308’ E32°50,29’ | 10-XII-2018 | leg. Josso Juhel Houé” || “Exc. | HUMAINS” (JFJC). 1♂ “ZIMBABWE | 80 km SW BULAWAYO | env. MARULA | 10-XII-1998 | P. Smrz leg.” (JFJC). 1♂ “S. Rhodesia | Mount Selinda | Chirinda Forest | 3.500 ft. | 15–26.i.1959. A.C. van Bruggen. || RMNH.INS | 1487900” (RMNH).

Redescription

Size: Length: 17.50–21.1 mm. Width: 11.1–12.1 mm.

Colour (Fig. 26): Dorsal black. Ventral dark brown.

Head (Fig. 26): Arcuate, surface of anterior edge dull and rugose with transverse wrinkles plus oblique punctures; surface of posterior edge smooth and shiny with ocellate punctures, each puncture bearing minute seta. Clypeus distinctly arcuate and marginate comprising a broad, continuous unpunctate strip. Fronto-clypeal suture faintly visible, clypeo-genal margin continuously rounded, genae slightly protruding externally. Frons with transverse carina distinctly upwardly raised in the middle; vertex carina straight with lateral tips touching lateral margins of eyes.

Pronotum (Fig. 26): Convex, wider than long, surface glossy, rugose on antero-lateral edge of pronotal disc, smooth on postero-lateral edge; uniformly punctate, except on medial line where anterior half unpunctate and posterior half faintly punctate comprising very shallow punctures; punctures bearing fine, short, brownish setae. Anterior part of pronotum excavated, forming three deep depressions; lateral depressions deeper than median depression; depressions shiny with sparse granules; median depression separated from lateral depressions by two longitudinal carinae; these longitudinal carinae toothed in the middle. Median depression with faint longitudinal medial line; anterior part of pronotal disc with distinct transverse tridentate carina; lateral depressions each with distinct laterally projected tooth-like tubercle.

Elytra (Fig. 26): Shorter in length than combined width with eight striae. Interstriae glossy, smooth, punctate and finely setose, except for rugosity on anterior quarter of interstriae 6–7; interstria 1 narrower than others, interstria 2 wider than others, remainder equal in width; interstriae 7–8 with ill-defined humeral callus.

Prosternum and propleuron: Surface shiny with a few irregular setae.

Ventrites: Mesoventrite surface dull, fully setose with few irregular punctures. Mesometaventral suture weakly rounded. Metaventrite surface shiny; irregularly punctate mid-posteriorly, unpunctate anteriorly.

Pygidium: Surface glossy, densely punctate with medium-sized punctures bearing setae.

Legs (Fig. 26): Between dorsal and ventral surface, profemoral margins with row of strong setae; dorsal surface shiny and glabrous, lateral edge with few punctures; ventral surface shiny, faintly punctate; upper anterior and posterior edges strongly marginate. Protibiae slender basally and stouter apically, four triangular teeth present on outer margin, basal tooth ill-defined; edge between teeth strongly concave; lateral row of stiff setae present on inner margin, two parallel rows of fine setae present on outer margin. Protibial spur inwardly curved. Protarsi with five visible cylindrical tarsomeres; protarsomere 5 longer than equally-sized protarsomeres 1–4. Meso- and metafemora complanate, strongly compact, mesofemora shorter than metafemora; surface shiny, punctate on posterior and lateral

edges with few setae, otherwise unpunctate. Meso- and metatibiae flattened, gradually expanded almost to apex with scattered stiff setae, indentation on outer margin. Meso- and metatibiae with two or single projecting spurs on inner margin, respectively. Meso- and metatarsomeres with five tarsomeres, row of stiff setae present on inner and outer margins; meso- and metatarsomere 1 compact, longer than meso- and metatarsomeres 5, 2, 3 and 4, ranked respectively by length; meso- and metatarsomere 5 adjacent to pair of tiny apical claws.

Aedeagus (Figs. 11, 16): Parameres symmetrical, ill-formed, trapezoidal in shape, basal internal protuberance forming right angle, apical tips truncate in lateral view.

Variability. Frontal carina not raised in the middle in females, although not so evident in some specimens. Frontal depressions relatively shallow in females.

Differential diagnosis. *Diastellopalpus orbigny* is somewhat similar to *D. infernalis* and *D. scholtzi*, new species as these species have three depressions on the anterior edge of pronotum. However, *D. orbigny* differs from these two species by the shape of the frontal and pronotal carinae. In *D. orbigny* the transverse frontal carina is arc-shaped, raised in the middle and the lateral tips comprise a right angle. In *D. infernalis*, the frontal carina is triangular and raised in the middle and in *D. scholtzi*, new species, it varies from straight without any dentation (coastal population) to triangular and raised in the middle (in inland population). The dorsal pronotal carina is toothed in the middle in *D. orbigny*, whereas in the other two species, the pronotal carina is straight, with no tooth medially (see Table 1, Figs. 5–7).

Taxonomic notes: *Diastellopalpus orbigny* was synonymized with *D. infernalis* (d’Orbigny, 1913: 723). Although subsequent studies did not examine the type specimens of both species, they followed d’Orbigny’s decision (Ferreira 1967, 1972; Josso & Prévost 2000). After studying the type material of both species, we conclude that they are not conspecific, therefore, we revalidate *D. orbigny* (see diagnosis and Table 1 for taxonomic delimitations).

Biological note and distribution. *Diastellopalpus orbigny* is primarily known from tropical highlands of Central Mozambique and eastern Zimbabwe. The species has been attracted to mammal dung, including human dung-baited pitfall traps.

TABLE 1. Summary of diagnostic characters and distribution of *Diastellopalpus infernalis*, *D. orbigny*, valid species and *D. scholtzi*, new species based on male specimens.

species	<i>D. orbigny</i> , valid species	<i>D. infernalis</i>	<i>D. scholtzi</i> , new species
frontal carina shape	arc-shaped with raised in the middle	triangular and raised in the middle	straight without dentation (coastal population), triangular and raised in the middle (inland population)
dorsal trasverse pronotal carina	toothed in the middle	without tooth	without tooth
pronotal sculpture in the anterior half	surface shiny, rugose and heavily punctate	surface shiny, rugose and heavily punctate	surface matt, smooth and finely punctate
distribution	only known in central Mozambique and Eastern Zimbabwe	widespread in eastern and central Africa	only known from Mozambique

Diastellopalpus quinquedens Bates, 1888

(Figs. 12, 17, 28–31, 32)

Diastellopalpus quinquedens Bates, 1888: 239; Kolbe 1893: 151; Kolbe 1901: 72; Felsche 1901: 154; Péringuey 1901: 265; d’Orbigny 1902: 311, 323; d’Orbigny 1913: 583, 722, 739; d’Orbigny 1914: 459; d’Orbigny 1915: 399, 401; Marcus 1914: 204; Marcus 1920: 192; Ferreira 1972: 551; Ferreira 1962: 479, 481–482; Josso & Prévost 2000: 20, 53, 104, 112–113, 119; Davis & Scholtz 2010: 415, 421; Davis *et al.* 2008: 196; Gillet & Barr 2018: 437.

Type locality: “Mamboia, East Central Africa” [Mamboya, Kilosa, Morogoro Region, Tanzania].

= *Onthophagus ponderosus* Péringuey, 1896: 156; Péringuey 1901: 265; Felsche 1901: 154; Ferreira 1967: 481; Ferreira 1972: 551; Josso & Prévost 2000: 53. (Junior subjective synonym confirmed).

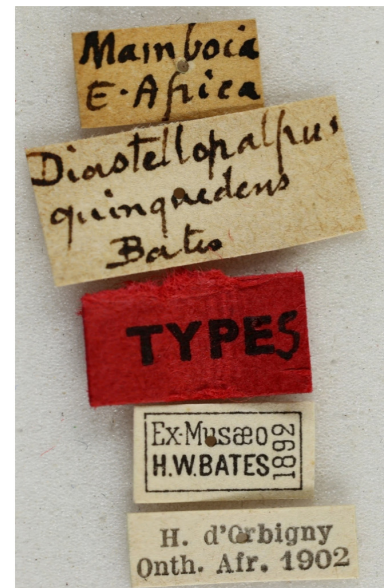
Type locality: “Salisbury” [Harare, Zimbabwe].

28



5 mm

29



LECTOTYPE: *Diastellopalpus quinquedens* Bates, 1888, des. GM Daniel, 2023

FIGURES 28–29. *Diastellopalpus quinquedens* Bates, 1888, lectotype (MNHN). 28, habitus, dorsal view; 29, labels. Photos courtesy of Olivier Montreuil, copyright MNHN.

Type material examined

Diastellopalpus quinquedens Bates, 1888. **LECTOTYPE**, here designated, ♂ (MNHN) (Figs. 28–29): “Mamboia | E. Africa [East Africa, Tanzania]” || “*Diastellopalpus quinquedens* Bates [Bates’ handwriting]” || “TYPES” || “Ex. Musæo | H.W.BATES | 1892 [vertical]” || “H. d’Orbigny | Onth. [*Onthophagus*] Afr. [Africa] 1902” || **LECTOTYPE**: *Diastellopalpus quinquedens* Bates, 1888, des. GM Daniel, 2023”.

Onthophagus ponderosus Péringuey, 1896. **LECTOTYPE**, here designated, ♂ (SAMC) (Figs. 30–31): “MASHONALD. | Salisbury.” || “n” || “*Onthophagus ponderosus* | typ | LP” [Péringuey’s handwriting] || “Type | SAM/Ent | 2701” || **LECTOTYPE**: *Onthophagus ponderosus* Péringuey, 1896, des. GM Daniel, 2023”.

Additional material examined (85 specimens): MALAWI: 1♂, 2♀♀ “C MALAWI | CHIMALIRO Forest | KASUNGU District | Sud de Viphya 1300 m | 16-I-2001 | J-F Josso réc.” || “Exc. | HUMAINS” (JFJC). 2♂♂ “MALAWI 1700 m | LUWAWA South VIPHYA | 21-I-2001 | J-F Josso réc.” || “Exc. | HUMAINS” (JFJC). 1♀ “Malawi | Dedza 15. 1. 98 | Bacovsky lgt.” (JFJC). **MOZAMBIQUE:** 3♂♂, 2♀♀, 19 unsexed “GORONGOSA MTS., [mountains] | Mozam. [Mozambique] (2300 ft) | 15.IV.[19]71 | Bornemissza & Aschenborn” || “105” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “*Diastellopalpus quinquedens* | Bates, 1888 | det. ALV. Davis, 2014” || “SANC—Pretoria | Database No: | COLS08332” (SANC). 1♀ “GORONGOSA MTS., [mountains] | Mozam [Mozambique] | (2300 ft) 15.IV.[19]71 | Bornemissza & Aschenborn” || “104” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “*Diastellopalpus quinquedens* | Bates, 1888 | det. ALV. Davis, 2014” || “SANC—Pretoria | Database No: | COLS08339” (SANC). 1♀ “GORONGOSA N.P., | Mozam. [Mozambique] 11–28.I.[19]72 | Bornemissza & Kirk” || “329” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “*Diastellopalpus Onthophagus lamelli-* | collis Qu | det.G.Frey 1974” || “SANC—Pretoria | Database No: | COLS08341” (SANC). **ZIMBABWE:** 1♂ “MAKUTI, Rhod. [Rhodesia] | (40 mi[les] 3. II. [19]72 | A.A. Kirk”

|| “355” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08335” (SANC). 1♂ “Salisbury | S. [southern] Africa | F. L. Snow” || “CNHM 1955 | Karl Brancsik Colln. | ex Eduard Knirsch” || “*Diastellopalpus* | *quinquedens* | Bates | det. F. S. Pereira 1959” (FMNH). 3♂♂, 1♀ “Salisbury | Mashonaland. | G. K. Marchall.” || “TM SOUTH AFRICA | TMSC09879” (TMSA). 1♂ “Rhodesia | Salisbury. | leg. O’Niel.” || “TM SOUTH AFRICA | TMSC09883” (TMSA). 1♀ “Salisbury | S. RHODESIA | 17/12/[19]72 | A. J. DUKE” || “TM SOUTH AFRICA | TMSC14052” (TMSA). 1♀ “Salisbury | S. RHODESIA | 5/12/[19]70 | A. J. DUKE” || “TM SOUTH AFRICA | TMSC14053” (TMSA). 13 unsexed “SALISBURY [=Harare], Rhod [Rhodesia] | (15 mi[les] E) 8.IV.[19]71 | Bornemissza & Aschenborn” || “90” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08348” (SANC). 1♀ “SILVERSTREAMS RIV., | Rhod [Rhodesia] 20.I.[19]74 | H.H. Aschenborn” || “1372” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08336” (SANC). 2♀♀ “SILVERSTREAMS RIV BRIDGE | Rhodesian Highlands 21.IV.[19]71 | Bornemissza & Aschenborn” || “143” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08349” (SANC). 5 unsexed “SILVERSTREAMS RIV | BRIDGE Rhod [Rhodesia] | (3 mi[les] N) 5.I.[19]72 | Bornemissza & Kirk” || “321” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08333” (SANC). 1♂ “Lowdale | S. RHODESIA | 26/12/[19]70 | A. J. DUKE” || “TM SOUTH AFRICA | TMSC14054” (TMSA). 1♀ “VUMBA AREA, Rhod [Rhodesia] 9.IV.[19]71 | (11 mi[les] SE Umtali, 5,200ft) | Bornemissza & Aschenborn” || “93” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” (SANC). 4 unsexed “UMTALI, Rhod [Rhodesia] | (22 mi[les] N) 9.IV.1971 | Bornemissza & Aschenborn” || “133a” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08334” (SANC). 3♂♂, 2♀♀ “UMTALI. S.RH [Southern Rhodesia] | I-1932 | P.A.SHEPPARD” || “TM SOUTH AFRICA | TMSC09886” (TMSA). 2♀♀ “CHIRINDA FOREST, Rhod. [Rhodesia] | (32 kms [kilometres] SE Chipinga) | 19.I.[19]76 875 m | A.L.V. Davis” || “2203” || “Ex Coll CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08338” (SANC). 1♀ “Chirinda F. [Forest] | XII.[19]52. vSon” || “TM SOUTH AFRICA | TMSC09885” (TMSA). 1♂, 2♀♀ “CHIPINGA, Rhod. [Rhodesia] | (10 mi[les] N) 21.IV.[19]71 | Bornemissza & Aschenborn” || “135” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08351” (SANC). 1♂ *idem* but with additional label “*Diastellopalpus* | *lamellicollis* | Qu det.G.Frey 1974” (SANC). 1♂ “CHIPINGA, Rhod. [Rhodesia] | (8 mi[les] N) 15.I.[19]72 | Bornemissza & Kirk” || “318” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08351” (SANC). 1♂ *idem* but with additional label “*Diastellopalpus* | *lamellicollis* | Qu det.G.Frey 1974” (SANC). 1♀ “CHIPINGA, Rhod. [Rhodesia] | (20 kms [kilometres] N) 18.I.[19]74 | H.H. Aschenborn” || “1364” || “Ex Coll. CSIRO | Div. Entomology | S. AFRICAN STATION” || “SANC—Pretoria | Database No: | COLS08337” (SANC). 1♀ “Mnt. SELINDA | S. RHOD. [Rhodesia], XII- | 1935, G.van Son” || “TM SOUTH AFRICA | TMSC09880” (TMSA). 2♀♀ “MT. SELINDA | S. RH. [Southern Rhodesia], I.959 | G. VAN SON” || “TM SOUTH AFRICA | TMSC09881” (TMSA). 1♂ “Fort Victoria, S. RH. [Southern Rhodesia] | I.1963, R.H. Zeiler | 20[°].10[']S-30[°].49[']E” || “TM SOUTH AFRICA | TMSC09882” (TMSA). 1♂ “Chikora | S. Rh. [Southern Rhodesia] | Sr.T.Neville” || “TM SOUTH AFRICA | TMSC09884” (TMSA). 1♀ “ZIMBABWE Manicaland | Bvumba Mts 1106m | S19°04,16' E32°50,15' | 09-XII-2018 | leg. Josso Juhel Houé” || “Exc. | HUMAINS” || “*Diastellopalpus* | *quiquedens* Bates | J-F Josso det. 2019” (JFJC). 2♂♂ “ZIMBABWE Manicaland | Bvumba Mts 1300m | S19°05,64' E32°45,60' | 08-XII-2018 | leg. Josso Juhel Houé” || “Exc. | HUMAINS” || “*Diastellopalpus* | *quiquedens* Bates | J-F Josso det. 2019” (JFJC). 9♂♂, 2♀♀ “ZIMBABWE Manicaland | Chimanimani Fst | S19°46,437' E32°53,032' | 15-16-XII-2018 1128m | leg. Josso Juhel Houé” || “Exc. | HUMAINS” || “*Diastellopalpus* | *quiquedens* Bates | J-F Josso det. 2019” (JFJC). 1♀ “ZIMBABWE Manicaland | Nyati Eco Park | S18°17,448' E31°57,216' | 19-21-XII-2018 1540m | leg. Josso Juhel Houé” || “Exc. | HUMAINS” || “*Diastellopalpus* | *quiquedens* Bates | J-F Josso det. 2019” (JFJC).

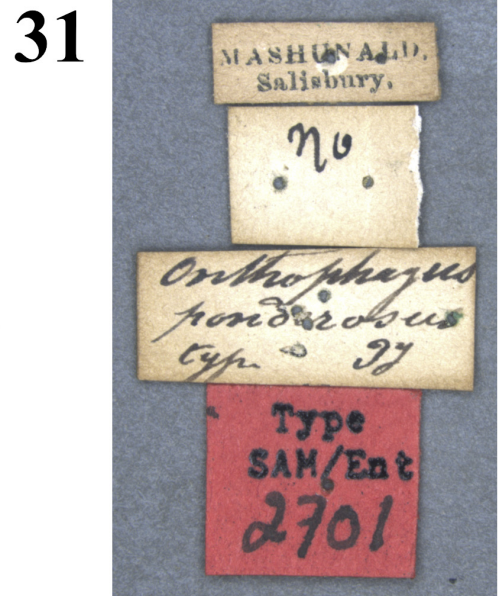
Redescription

Size: Length: 20.10–21.00 mm, width: 13.00–11.80 mm.

Colour (Figs. 28, 30): Dorsal black. Ventral dark brown.

Head (Figs. 28, 30): Arcuate, surface dull, rugose with transversal wrinkles, punctures oblique antero-laterally, posterior edge with ocellate punctures, punctures each bearing minute yellowish seta. Clypeus arcuate and distinctly

continuously marginate with broad, unpunctate strip. Clypeo-genal suture visible, genae slightly protruding externally. Transverse carinae present on both frons and vertex, the latter higher than the former; frontal carina continuous, vertex carina weakly multiserrated with small tooth medially. Lateral tips of vertex carina reaching margins of eyes.



LECTOTYPE: *Onthophagus ponderosus* Péringuey, 1896, des. GM Daniel, 2023

FIGURES 30–31. *Onthophagus ponderosus* Péringuey, 1896 (= junior subjective synonym of *Diastellopalpus quinquedens*), lectotype (SAMC). 30, habitus, dorsal view; 31, labels. Photos courtesy of G.M. Daniel, copyright SAMC.

Pronotum (Figs. 28, 30): Wider than long, surface smooth, shiny, uniformly punctate, except on unpunctate edge of v-shaped posterior margin of pronotal disc; punctures with fine setae. Anterior part of pronotum with median depression and sharp, tridentate transverse carina, very prominent in the middle, abruptly sinuate laterally without reaching lateral pronotal margins.

Elytra (Figs. 28, 30): Shorter in length than combined width ovoid with eight striae. Interstriae dull, rugose on anterior eighth, remainder smooth, punctate and finely setose; interstria 1 narrower than others, interstria 2 wider on anterior half and narrow on posterior half. Interstriae 7–8 with ill-defined humeral callus.

Prosternum and *propleuron*: Surface dull, with a few setae set irregularly.

Ventrites: Mesoventrite surface shagreened, unpunctate, glabrous. Mesometaventral suture downwardly sinuate medially. Metaventrite surface shiny, irregularly punctate, except, on unpunctate medial line; antero-lateral edge with long setae, other parts glabrous.

Pygidium: Dull, faintly punctate with few scattered setae.

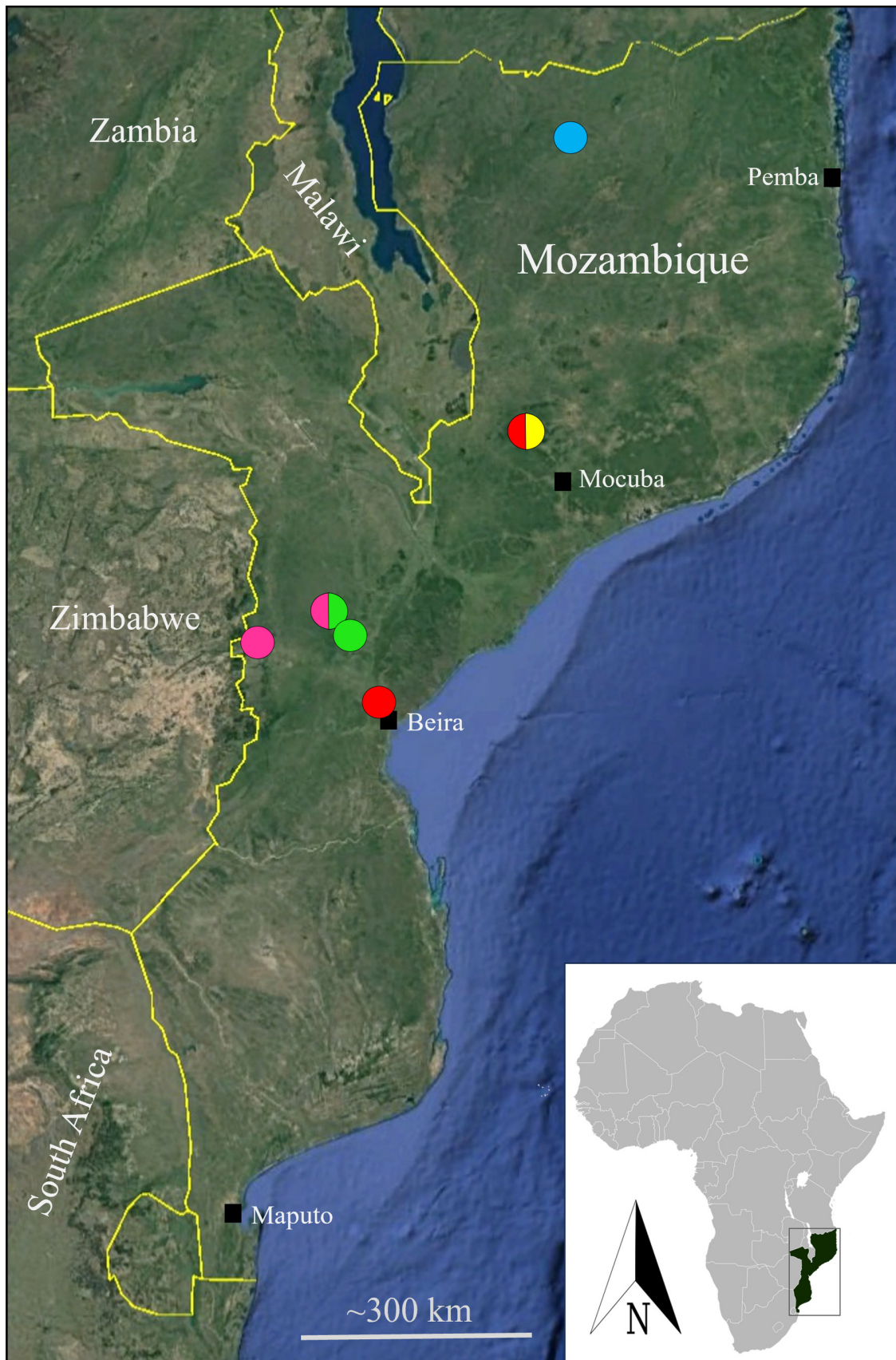


FIGURE 32. Distribution of *Diastellopalpus* van Lansberge, 1886 species in Mozambique: red circles: *Diastellopalpus scholtzi* Daniel, Strümpher, Josso & Davis new species; blue circle: *Diastellopalpus infernalis* van Lansberge, 1887; yellow circle: *Diastellopalpus neavei* (d’Orbigny, 1914); pink circles: *Diastellopalpus orbigny* Péringuey, 1904, valid species; green circles: *Diastellopalpus quinque*dens Bates, 1888.

Legs: Between dorsal and ventral surface, profemoral margins with row of strong setae; dorsal surface shiny and glabrous, laterally punctate; ventral surface smooth, shiny and punctate, with some punctures bearing fine setae; upper anterior and posterior edges strongly marginate. Protibiae slender basally and stouter apically, four triangular teeth present on outer margin; edge between teeth weakly sinuate. Lateral row of stiff setae present on inner margin, two parallel rows of fine setae present on outer margin. Protibial spur inwardly curved. Protarsomere 5 longer than protarsomeres 1–4, which more or less equal in size. Meso- and metafemora complanate, surface shiny, glabrous, faintly punctate; posterior margin with distinct, apical-basal, longitudinal depression. Mesofemora shorter than metafemora. Meso- and metatibiae flattened, gradually expanded almost to apex with scattered stiff setae, indentation on outer margin. Meso- and metatarsomeres with 5 tarsomeres, meso- and metatarsomere 1 compact, longer than meso- and metatarsomeres 5, 2, 3 and 4, ranked respectively by length, row of stiff setae on inner and outer margins.

Aedeagus (Figs. 12, 17): Parameres symmetrical (although one seems to be slightly shorter), basal internal protuberance or lobe obtusely angular in lateral view.

Variability. The shape of the head is arcuate in males and ogival-shaped in females. Males have a narrower and longer pygidium.

Differential diagnosis. *Diastellopalpus quinquedens* is morphologically similar to *D. lamellicollis* (Quedenfeldt, 1884), however, in *D. quinquedens* the transverse vertex carina is situated between the eyes or between the posterior half of the eyes; vertex carina has a small tooth in the middle. While in *D. lamellicollis* the vertex carina lies between the anterior half of the eyes or at the mid-point, immediately in front of the eyes; without any tooth in the middle.

Taxonomic notes. Felsche (1901: 154) regarded *Onthophagus ponderosus* Péringuey, 1896 as a junior subjective synonym of *Diastellopalpus quinquedens*, which was subsequently confirmed by Ferreira (1967, 1972), Josso & Prévost (2000), and the present study.

Biological note and distribution. *Diastellopalpus quinquedens* is centred in woodlands on tropical uplands of south-eastern Africa in the following countries: Malawi, Mozambique (Fig. 32), Tanzania, Zambia and Zimbabwe (Davis & Scholtz 2010; Josso & Prévost 2000).

Identification key to the species of *Diastellopalpus* recorded from Mozambique

1. Anterior declivity of the pronotum with three depressions, two lateral and one medial; distinct tooth-like tubercle strongly projected laterally to lateral depressions; transverse pronotal carina blunt 2
- Anterior declivity of the pronotum with only one shallow median depression; without any tooth-like pronotal tubercle; transverse pronotal carina sharp-edged (Central Mozambique: Manica Province: Manica; Sofala Province: Gorongosa National Park) (Fig. 28) *Diastellopalpus quinquedens* Bates, 1888
2. Vertex with a transverse carina in both males and females 3
- Vertex with a long coniform horn in males, with four rough transverse tubercles in females (Central Mozambique: Zambézia Province: Mount Mabu) (Fig. 24) *Diastellopalpus neavei* d’Orbigny, 1914
3. Pronotum with non-interrupted transverse carina. Anterior declivity without two longitudinal carinae toothed in the middle 4
- Pronotum with distinct transverse carina toothed in the middle (Fig. 7). Anterior declivity with two longitudinal carinae toothed in the middle. Mozambique (Central Mozambique: Sofala Province: Gorongosa National Park) (Fig. 26) *Diastellopalpus orbigny* Péringuey, 1904
4. Pronotal surface matt, smooth and finely punctate in the anterior half (Fig. 5). Parameres with abrupt and strong lateral protrusions in dorsal view (Fig. 13) (Central Mozambique: Sofala Province: Beira and Dondo; Zambézia Province: Mount Mabu) (Fig. 4) *Diastellopalpus scholtzi* Daniel, Strümpher, Josso & Davis, new species
- Pronotal surface shiny, rugose and heavily punctate in the anterior half (Fig. 6). Parameres simple, without abrupt and strong lateral protrusions in dorsal view (Fig. 14) (north-western Mozambique: Niassa Province, Lugenda River) *Diastellopalpus infernalis* van Lansberge, 1887

Discussion

This paper provides updates on the alpha taxonomy of *Diastellopalpus* species from Mozambique, including the description of a new species, new country records, a species revalidation, and an identification key to the species. The results raise the total number of valid dung beetle species from Mozambique to 330 (Daniel *et al.* 2023a, b,

2024) and the total number of valid *Diastellopalpus* species in Africa to 36 (Walter 2013; Josso & Prévost 2014).

All species of *Diastellopalpus* are primarily associated with savanna woodlands or intertropical forests (montane or lowland) bar, *Diastellopalpus johnstoni* (Waterhouse, 1885), which is associated with montane grassland in west central and east Africa (Davis & Scholtz 2010). In Mozambique, however, former extensive forests are under threat due to anthropogenic actions, viz. deforestation, land use conversion for farming activities, uncontrolled bushfires and climatic factors such as flooding and cyclones (Joaquim-Meque *et al.* 2023; Hoffmann *et al.* 2020). The holotype and one of the paratypes of *Diastellopalpus scholtzi* new species were collected over 50 years ago in a lowland coastal forest in Dondo and Beira, respectively. The current state of forests at these two localities is highly degraded due to development of human settlements, urbanisation and wood extraction (Gimo M Daniel, personal observation), which raises the question of whether any specialist forest dung beetles survive in the remnants of these coastal forest patches.

In contrast, Mount Mabu in northern Mozambique harbours a fairly intact afro-montane forest, where two species of *Diastellopalpus* are reported to occur: *D. neavei* and *D. scholtzi* new species. The former species comprises a new country record, which was previously known only from the type locality (Mulanje, Malawi) represented by 24 syntypes (Cambefort & Mauchamp 1980). Subsequently, individuals of this species were collected at Mulanje in 2011 (Josso unpublished data). *D. neavei* was highly abundant (>500 specimens) during our biological expedition at Mount Mabu. On the other hand, *D. scholtzi*, new species was represented by only 17 specimens.

There is observable external morphological variation among specimens of *D. scholtzi*, new species inhabiting the inland and highland forest on Mount Mabu compared to those in the coastal lowland forests of Dondo and Beira. Specifically, the frontal carina varies from triangular in the inland population to straight and continuous in the coastal population. However, despite this distinction, the male genitalia of individuals from Mount Mabu closely resemble those of the coastal holotype of the new species. As a result, we have regarded these two populations as conspecific. This regional variation presents an opportunity for future population genetic studies to validate our current hypothesis.

As previously reported (Daniel *et al.* 2023a, b, 2024), the records of *D. neavei* and *D. scholtzi* new species emphasize the biological importance of Mount Mabu and add to calls for the protection of its unique biodiversity as this forest is currently prone to degradation by anthropogenic actions. While two other species, *D. orbignyi* and *D. quinque-dens*, are well-protected in highland forests at Mount Gorongosa in Gorongosa National Park, central Mozambique, the latter species is likely to also occur associated with mountain forests in Chimanimani National Park, Manica Province, on the border between Mozambique and Zimbabwe where the surrounding region is the type locality of its junior subjective synonym *D. ponderosus*. Lastly, *D. infernalis* is protected in the riverine forest of Niassa Game Reserve, northwestern Mozambique.

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